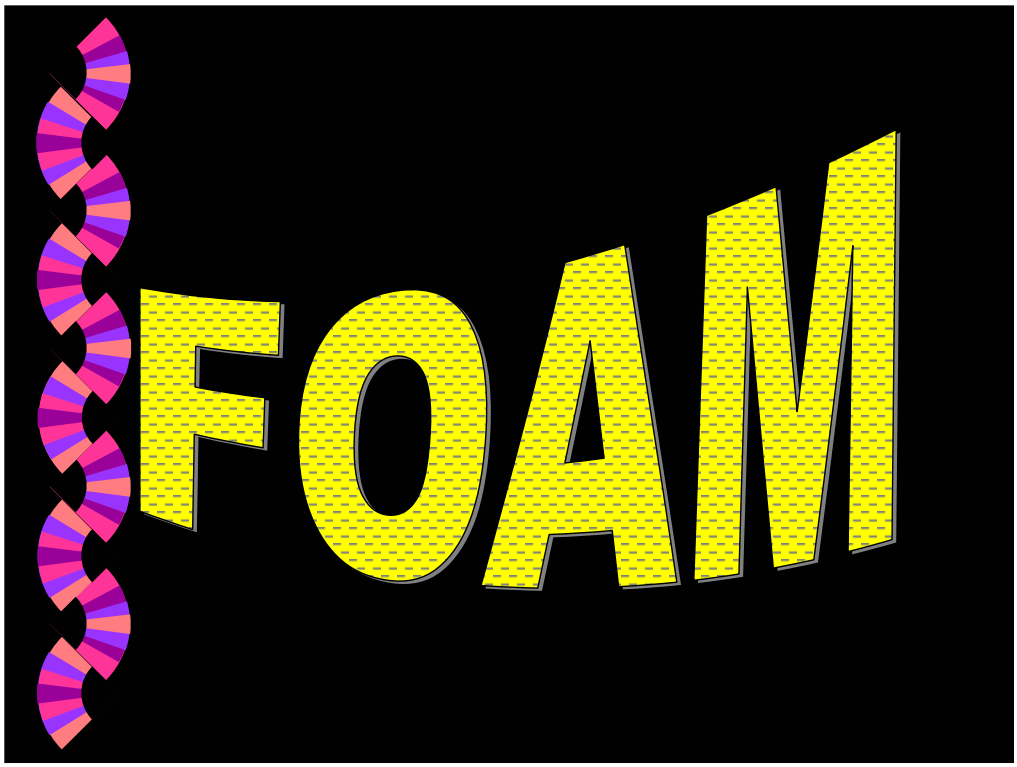
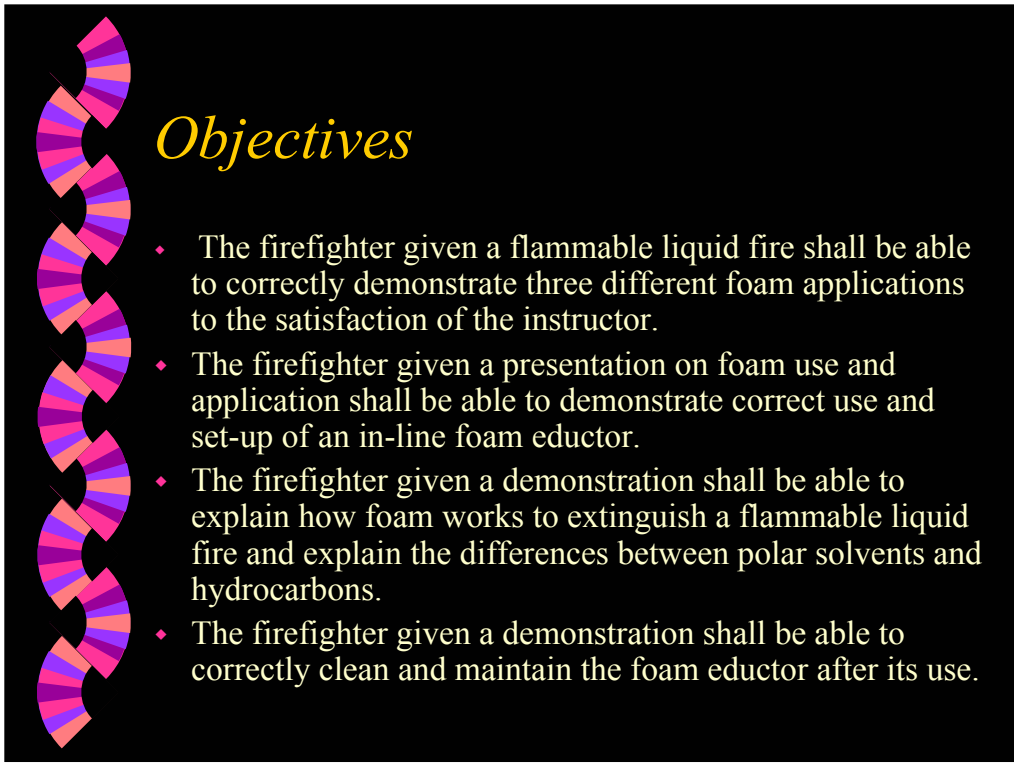
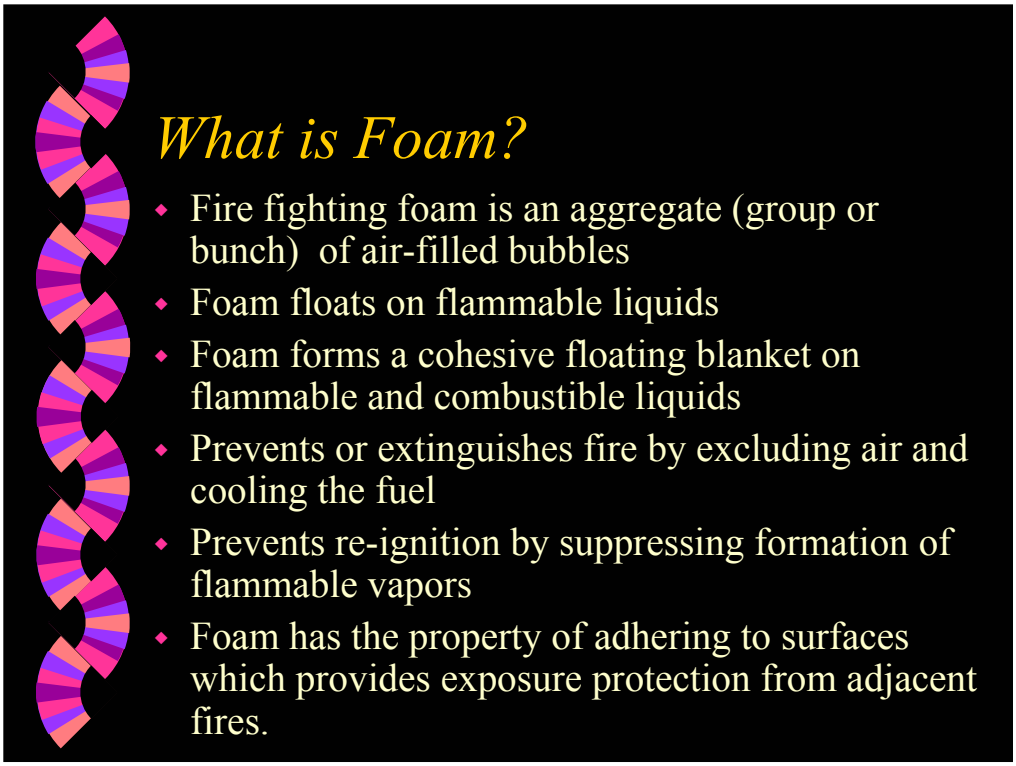
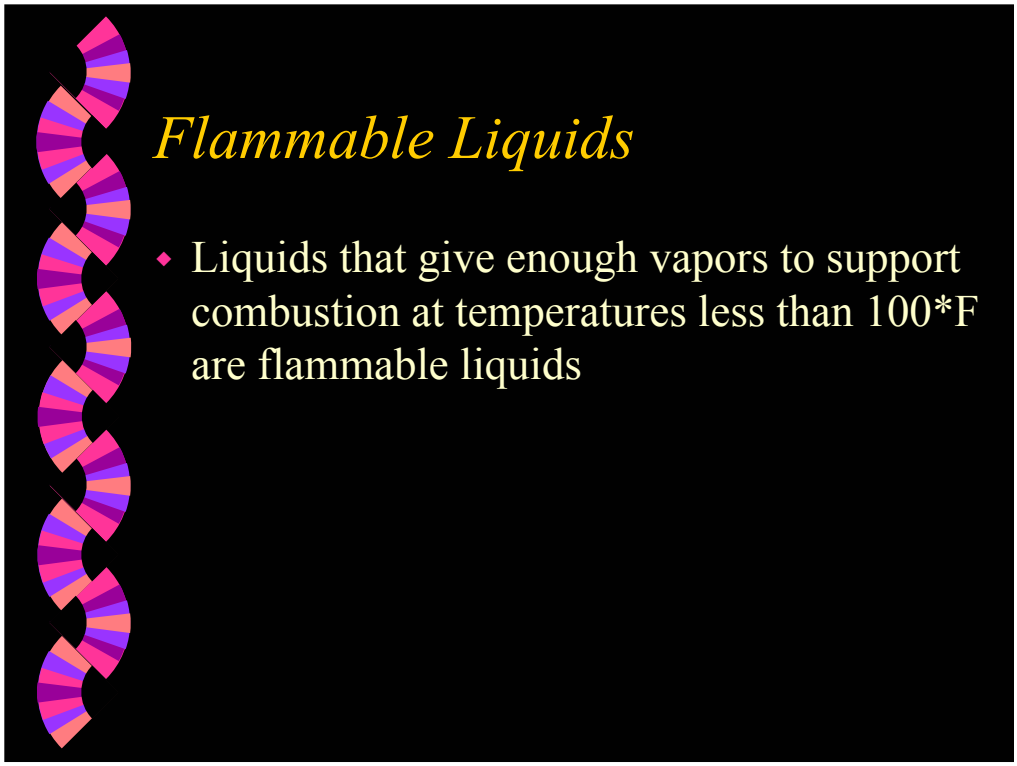
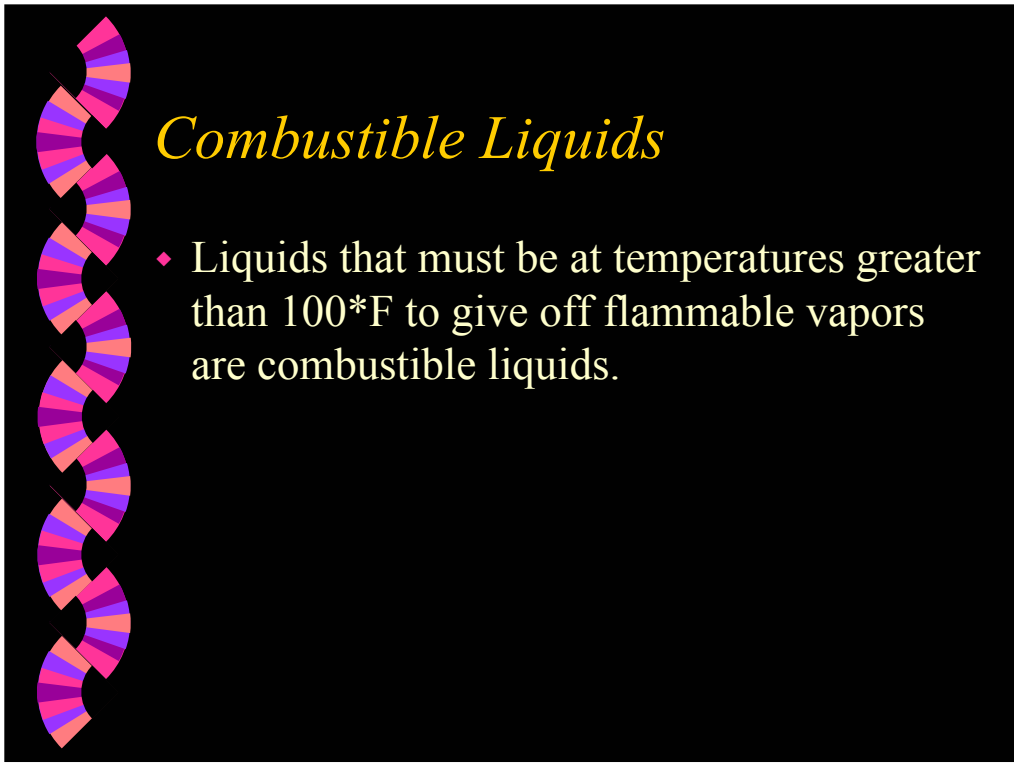
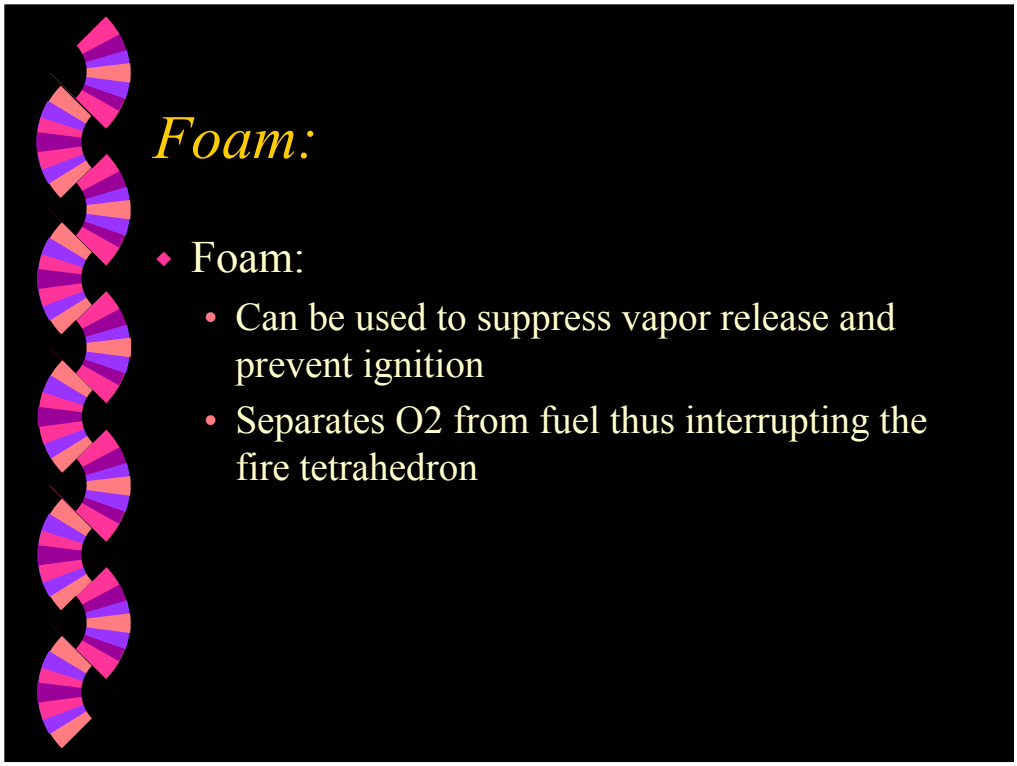

FOAM


Objectives
The firefighter given a flammable liquid fire shall be able to correctly demonstrate three different foam applications to the satisfaction of the instructor.
The firefighter given a presentation on foam use and application shall be able to demonstrate correct use and set-up of an in-line foam eductor.
The firefighter given a demonstration shall be able to explain how foam works to extinguish a flammable liquid fire and explain the differences between polar solvents and hydrocarbons.
The firefighter given a demonstration shall be able to correctly clean and maintain the foam eductor after its use.


What is Foam?
Fire fighting foam is an aggregate (group or bunch) of air-filled bubbles
Foam floats on flammable liquids
Foam forms a cohesive floating blanket on flammable and combustible liquids
Prevents or extinguishes fire by excluding air and cooling the fuel
Prevents re-ignition by suppressing formation of flammable vapors
Foam has the property of adhering to surfaces which provides exposure protection from adjacent fires.

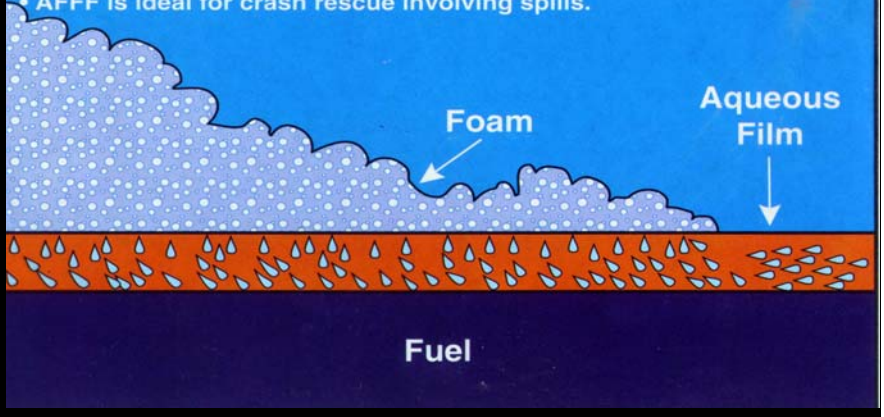

Flammable Liquids
Liquids that give enough vapors to support combustion at temperatures less than 100*F are flammable liquids

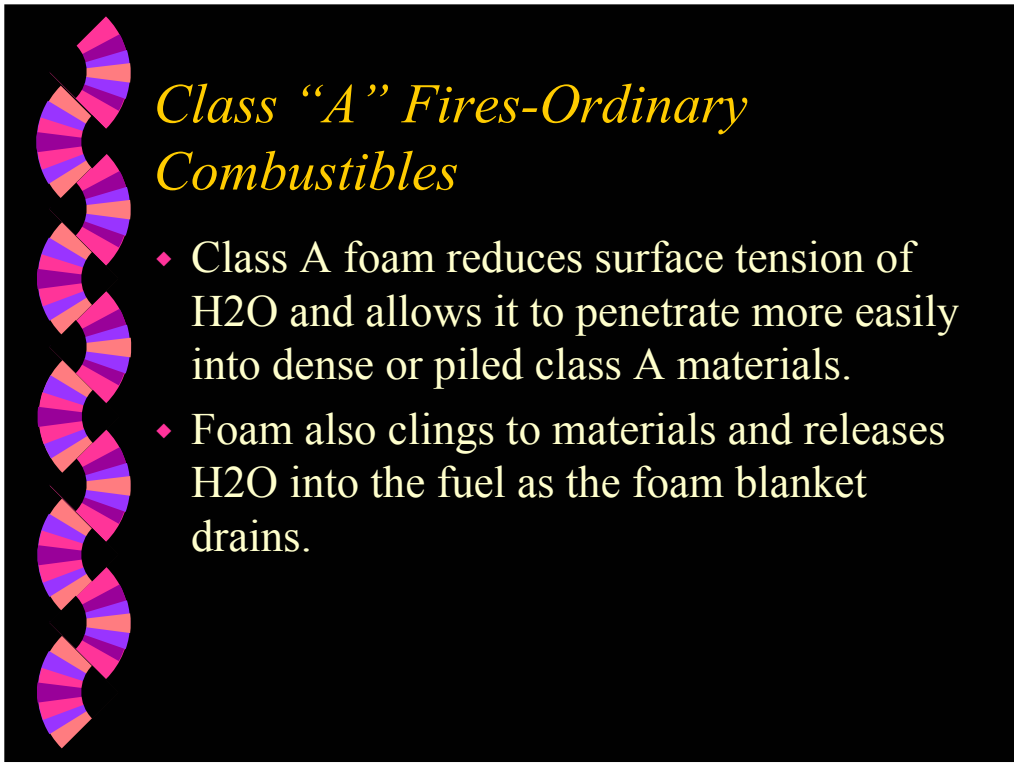

Combustible Liquids
Liquids that must be at temperatures greater than 100*F to give off flammable vapors are combustible liquids.


Foam:
Foam:
Can be used to suppress vapor release and prevent ignition
Separates O2 from fuel thus interrupting the fire tetrahedron

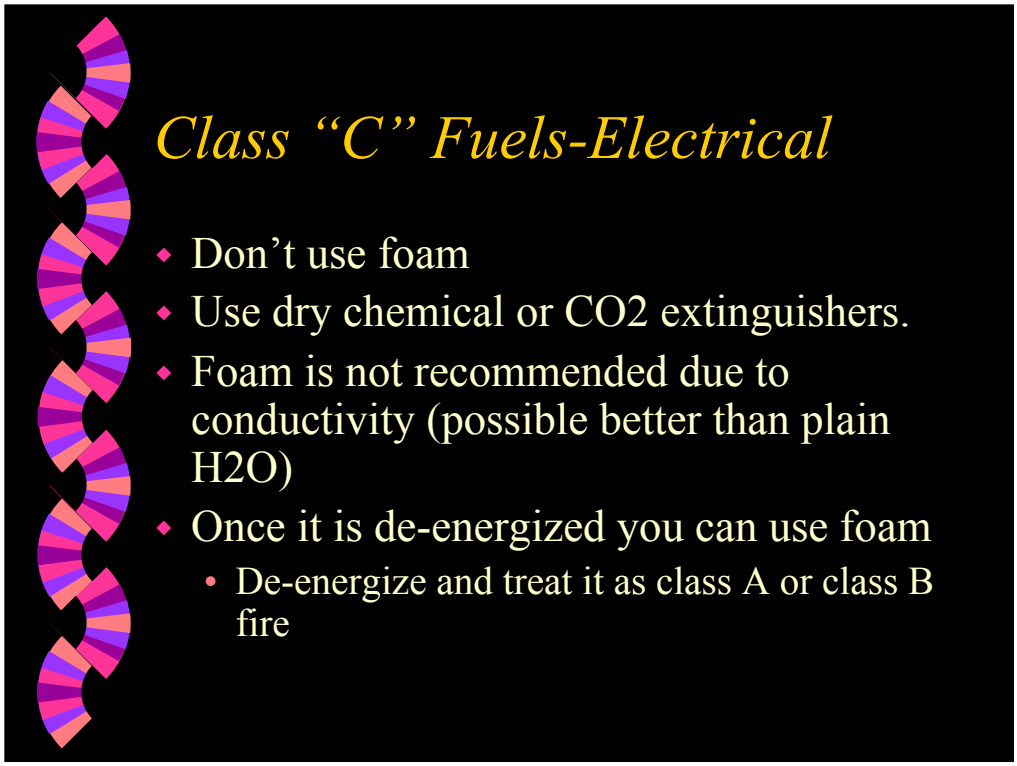
How Foam Works

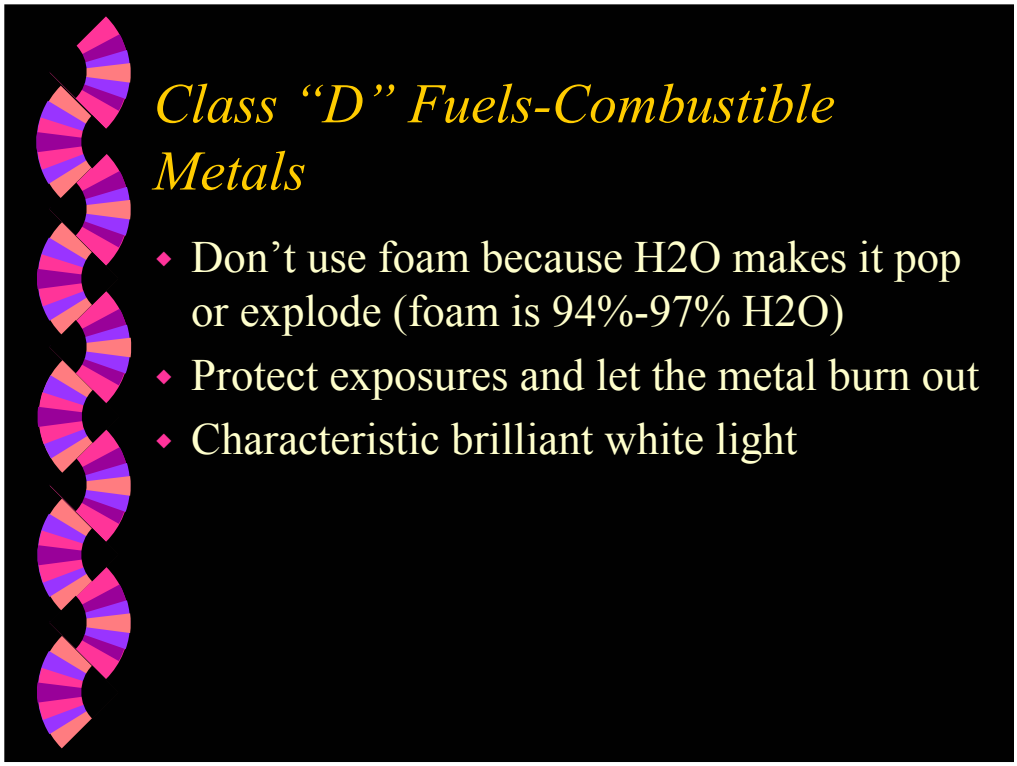
- Water drained from foam blanket floats on hydrocarbon fuel spills.
- This "light water" sends an air-excluding film ahead of foam blanket.
- AFFF can be used with fresh or salt water.
- AFFF is ideal for crash rescue involving spills.

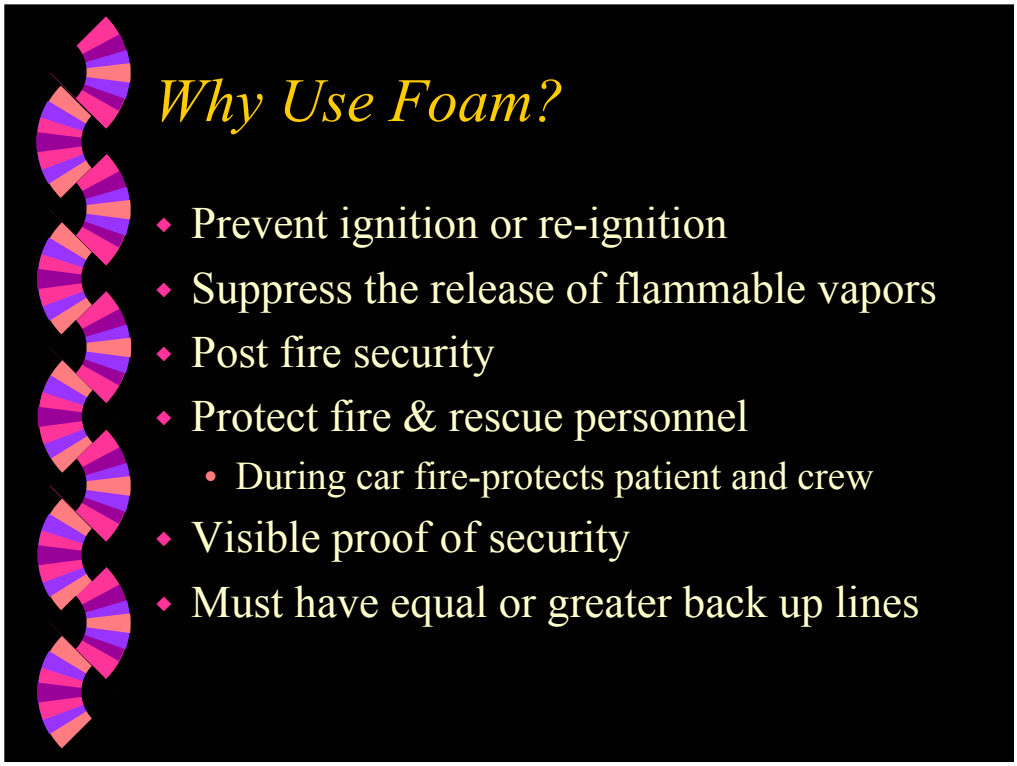


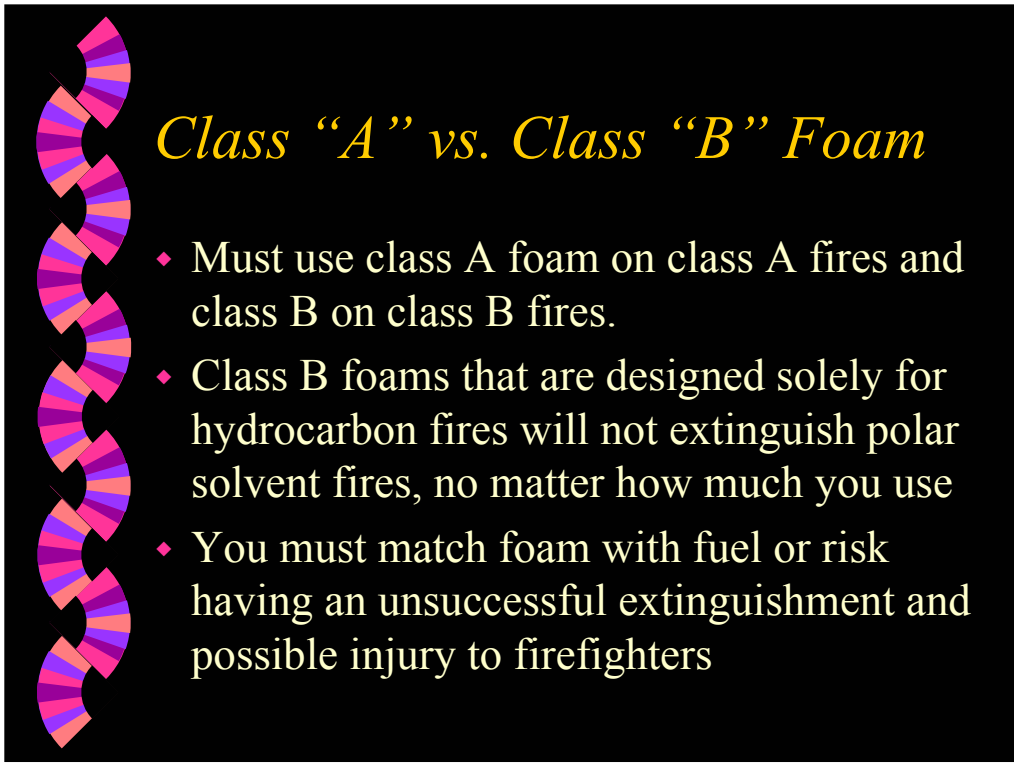

Class “A” Fires-Ordinary Combustibles
Class A foam reduces surface tension of H2O and allows it to penetrate more easily into dense or piled class A materials.
Foam also clings to materials and releases H2O into the fuel as the foam blanket drains.

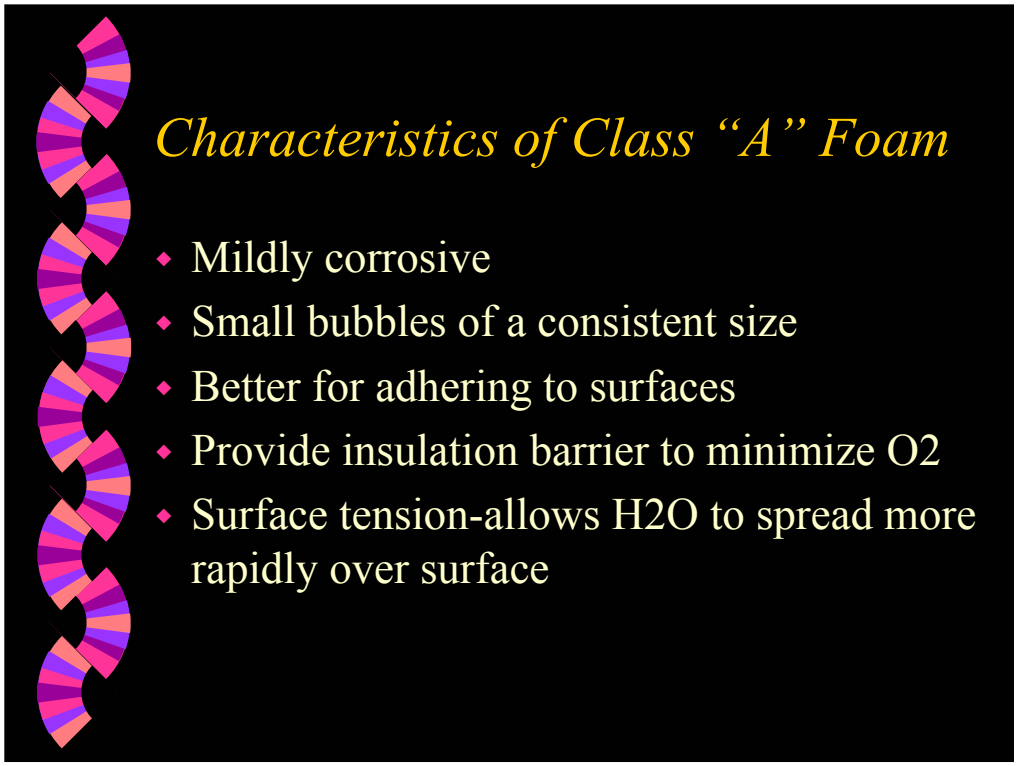

Class "B" Fuels-
Flammable/Combustible Liquids
Class "B" fuels are simply liquid fuels
Hydrocarbon fuels-petroleum based-float on H2O (won't mix with H2O). Foam floats on hydro carbons thus suppressing vapors and extinguishing
Products of crude oil
Polar Solvent fuels-mix with H2O-require special alcohol resistant foam that won't mix with fuel
Synthetically produced

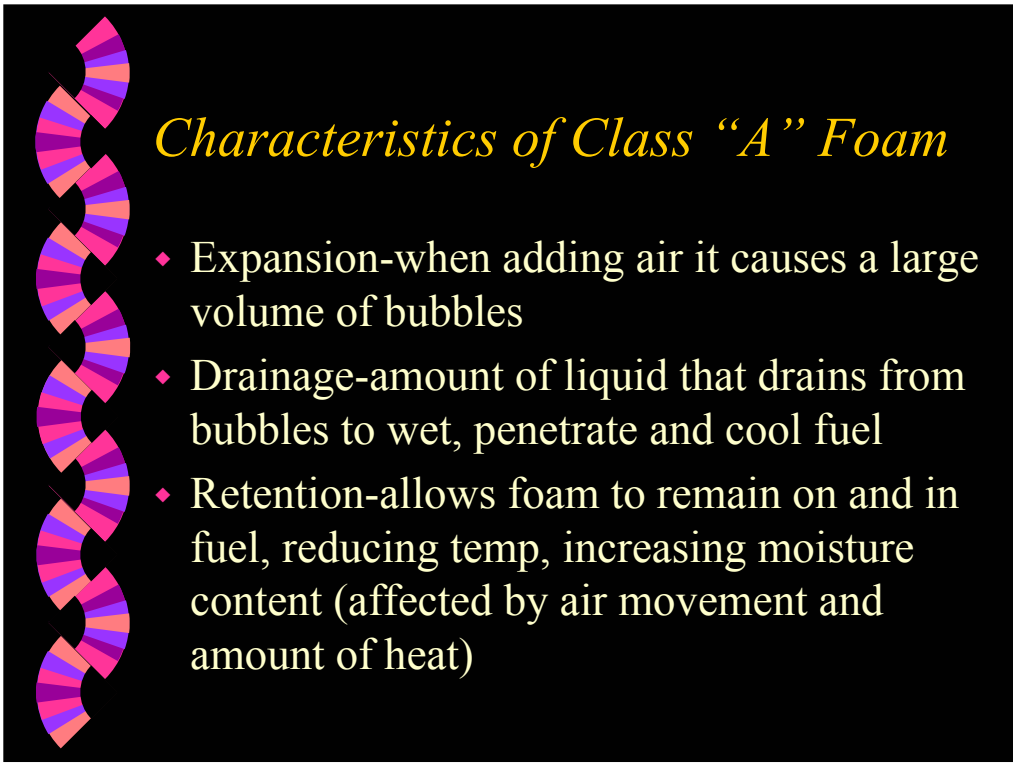

Class "C" Fuels-Electrical
Don't use foam
Use dry chemical or CO2 extinguishers.
Foam is not recommended due to conductivity (possible better than plain H2O)
Once it is de-energized you can use foam
De-energize and treat it as class A or class B fire

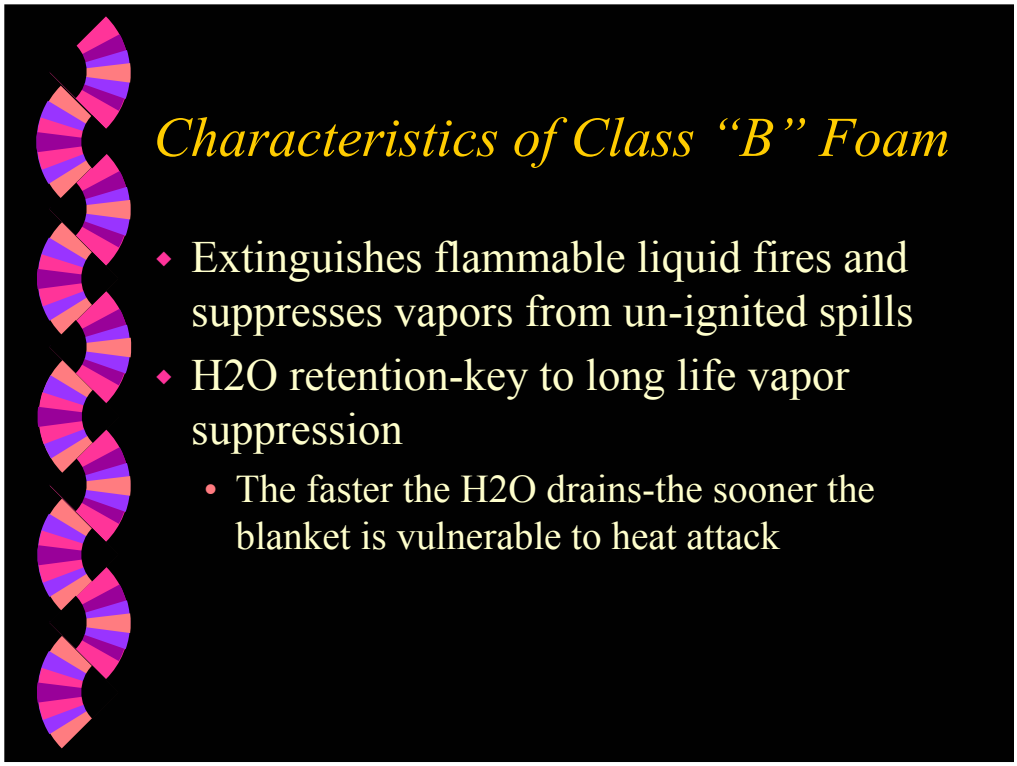

Class “D” Fuels-Combustible Metals
Don’t use foam because H2O makes it pop or explode (foam is 94%-97% H2O)
Protect exposures and let the metal burn out
Characteristic brilliant white light

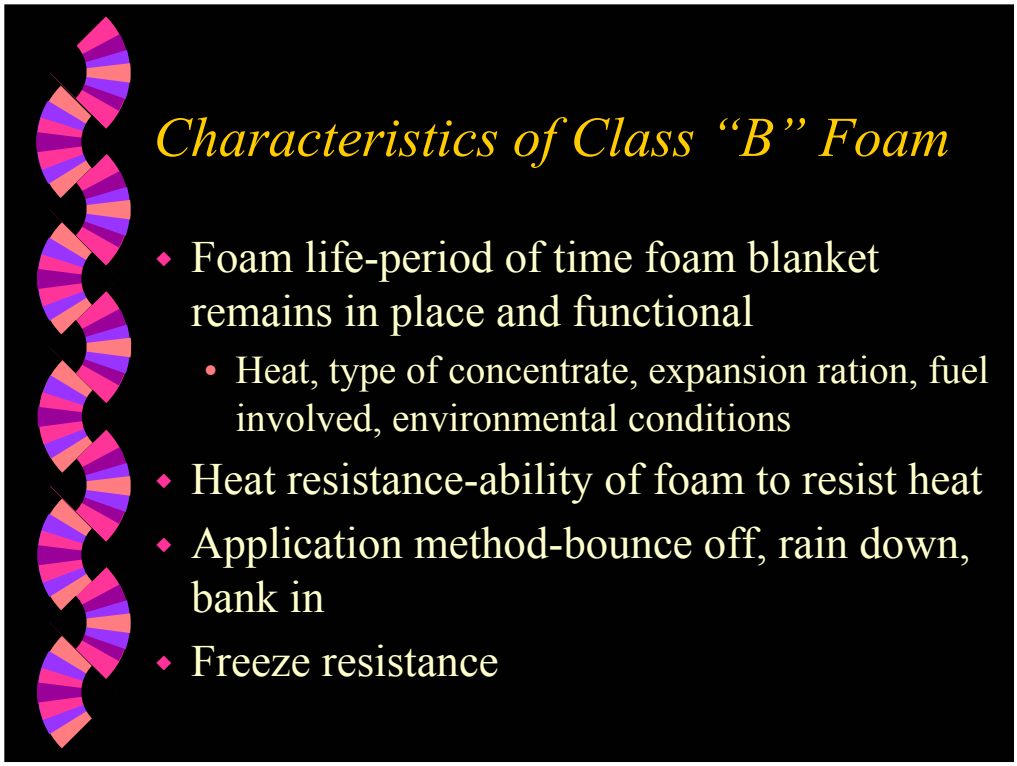

Why Use Foam?
Prevent ignition or re-ignition
Suppress the release of flammable vapors
Post fire security
Protect fire & rescue personnel
During car fire-protects patient and crew
Visible proof of security
Must have equal or greater back up lines

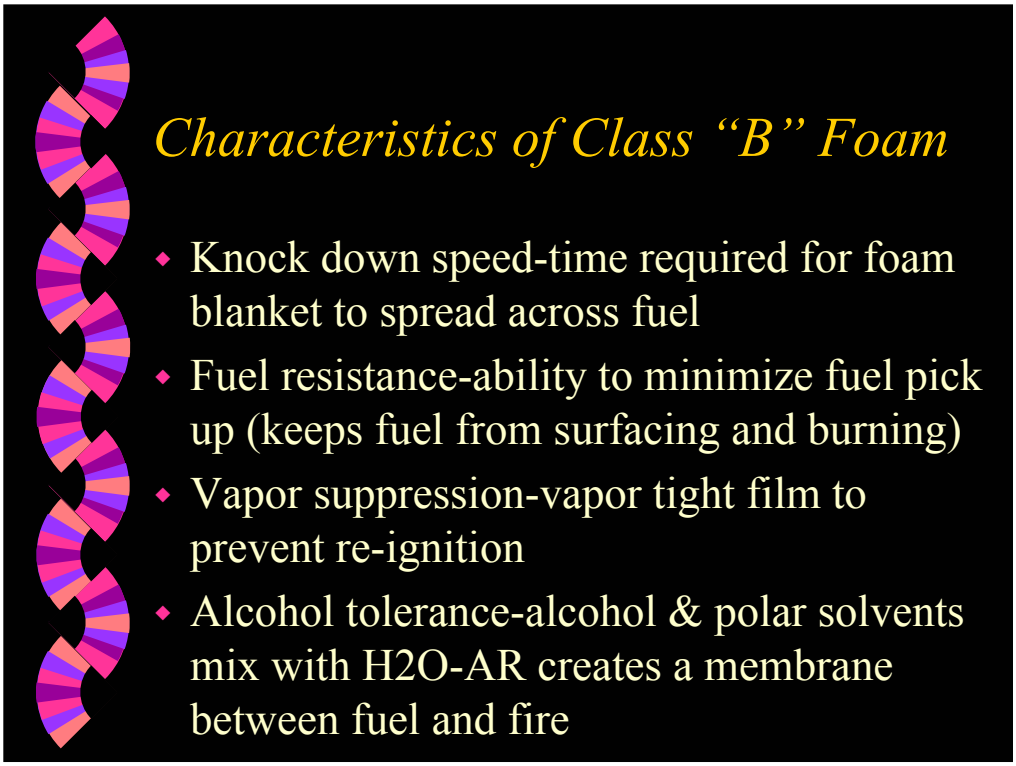

Class “A” vs. Class “B” Foam
Must use class A foam on class A fires and class B on class B fires.
Class B foams that are designed solely for hydrocarbon fires will not extinguish polar solvent fires, no matter how much you use
You must match foam with fuel or risk having an unsuccessful extinguishment and possible injury to firefighters


Characteristics of Class "A" Foam
Mildly corrosive
Small bubbles of a consistent size
Better for adhering to surfaces
Provide insulation barrier to minimize O2
Surface tension-allows H2O to spread more rapidly over surface

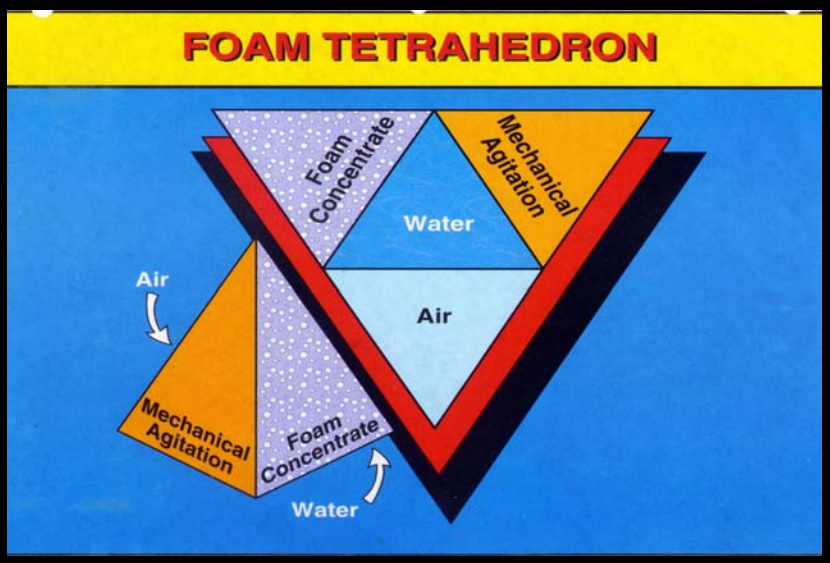

Characteristics of Class "A" Foam
Expansion-when adding air it causes a large volume of bubbles
Drainage-amount of liquid that drains from bubbles to wet, penetrate and cool fuel
Retention-allows foam to remain on and in fuel, reducing temp, increasing moisture content (affected by air movement and amount of heat)


Characteristics of Class "B" Foam
Extinguishes flammable liquid fires and suppresses vapors from un-ignited spills
H2O retention-key to long life vapor suppression
The faster the H2O drains-the sooner the blanket is vulnerable to heat attack


Characteristics of Class "B" Foam
Foam life-period of time foam blanket remains in place and functional
Heat, type of concentrate, expansion ration, fuel involved, environmental conditions
Heat resistance-ability of foam to resist heat
Application method-bounce off, rain down, bank in
Freeze resistance


Characteristics of Class "B" Foam
Knock down speed-time required for foam blanket to spread across fuel
Fuel resistance-ability to minimize fuel pick up (keeps fuel from surfacing and burning)
Vapor suppression-vapor tight film to prevent re-ignition
Alcohol tolerance-alcohol & polar solvents mix with H2O-AR creates a membrane between fuel and fire

Foam Tetrahedron

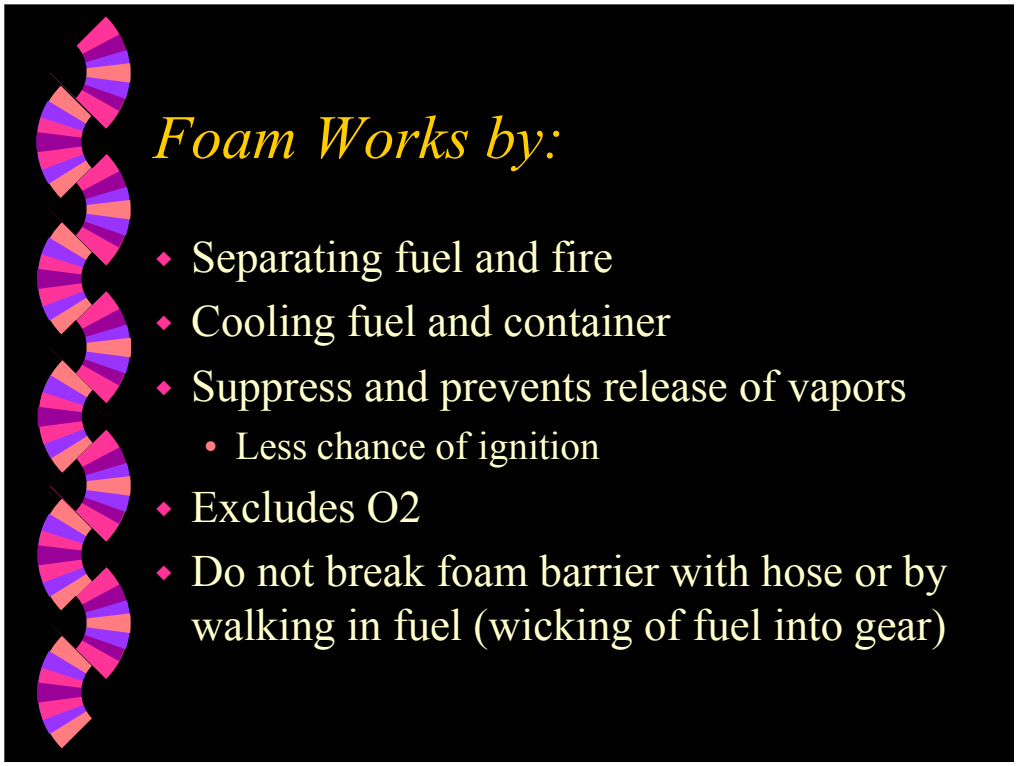


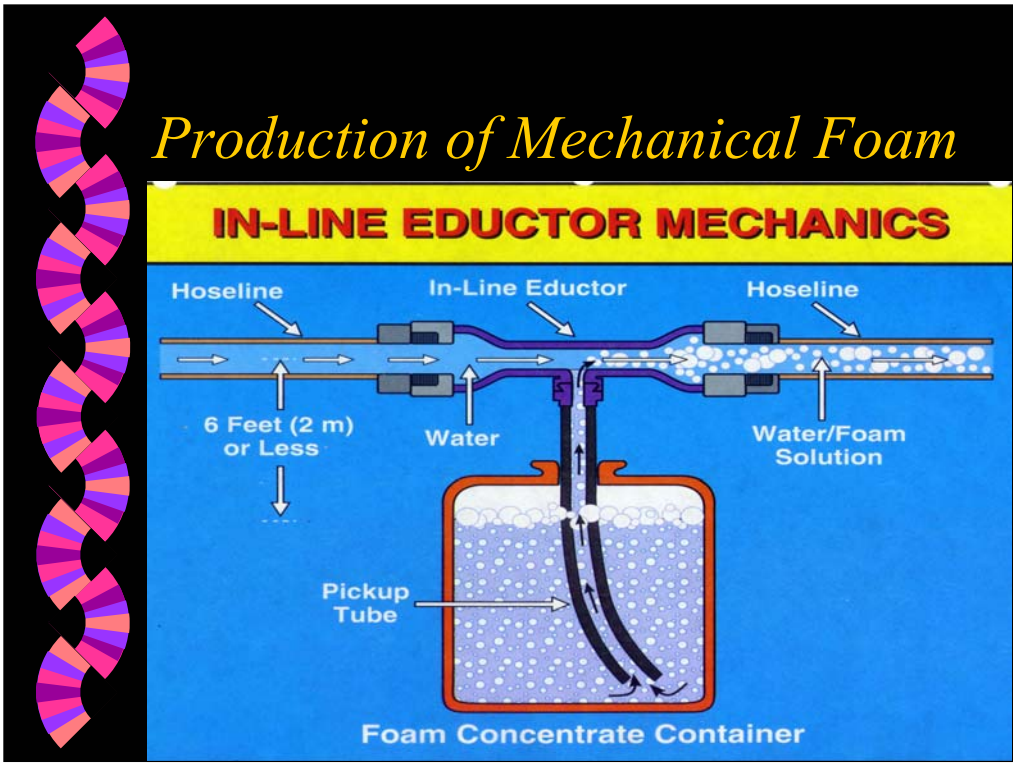
•To produce a quality foam blanket, four elements are necessary:

- •foam concentrate
- •water
- •air
- •aeration (mechanical agitation)

•All of these elements must be combined properly to produce a quality foam blanket.

•If any of the elements are missing or not correctly proportioned, the result is poor quality foam or no foam at all


Foam Works by:
Separating fuel and fire
Cooling fuel and container
Suppress and prevents release of vapors
Less chance of ignition
Excludes O2
Do not break foam barrier with hose or by walking in fuel (wicking of fuel into gear)



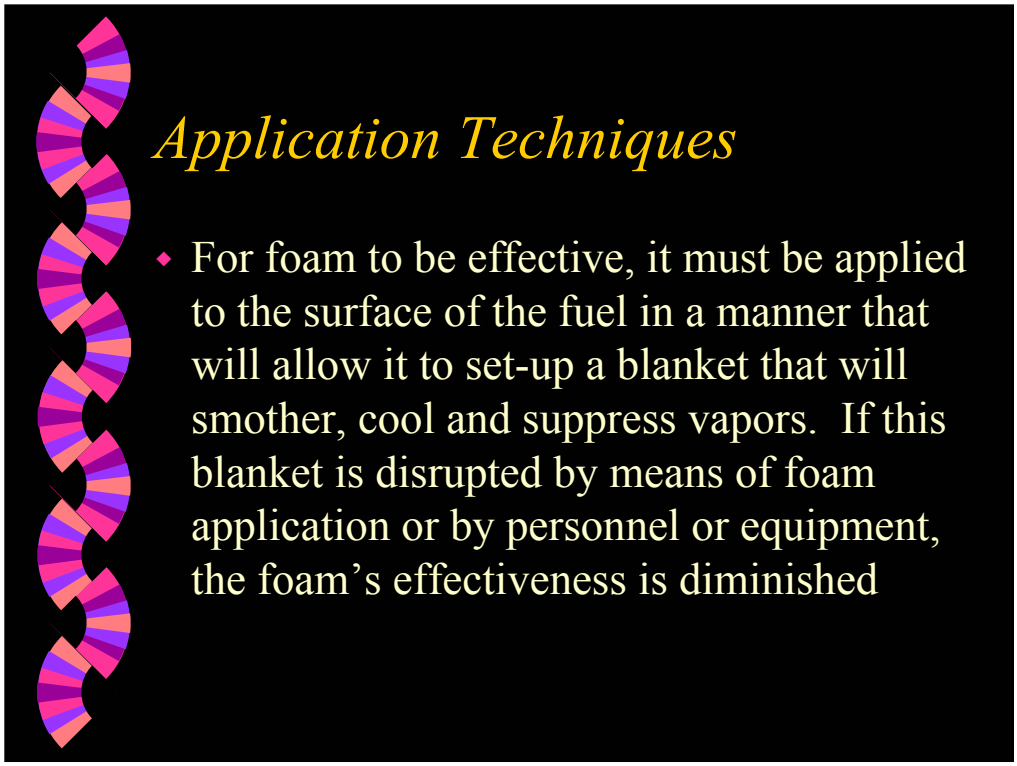
•Water is mixed with foam concentrate at the proportioning device

•The mixture of concentrate and water is referred to as foam solution

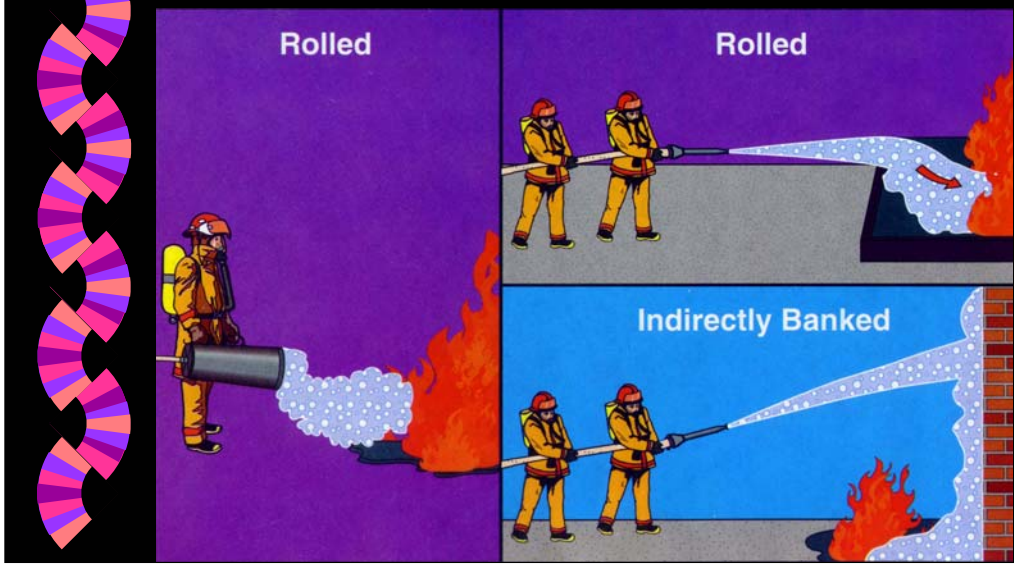
•Solution travels through the hose or pipe to the air aspirating discharge device

•At the discharge device, air is introduced into the foam solution

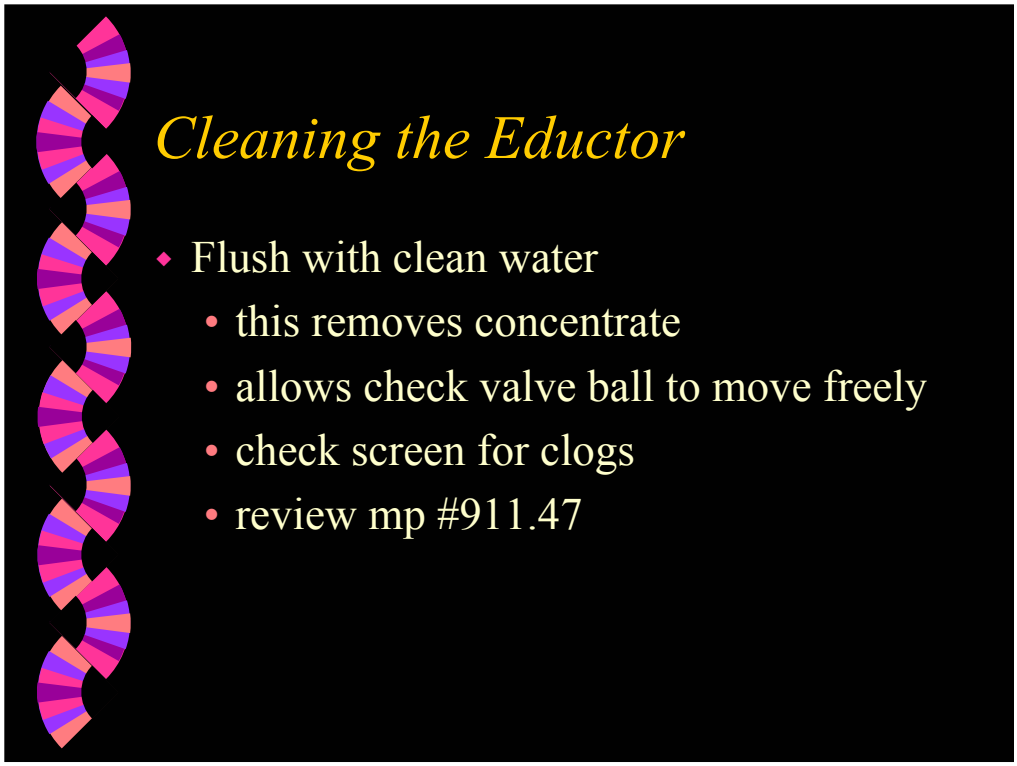
•The mixture of foam solution and air produces a finished (expanded) foam blanket

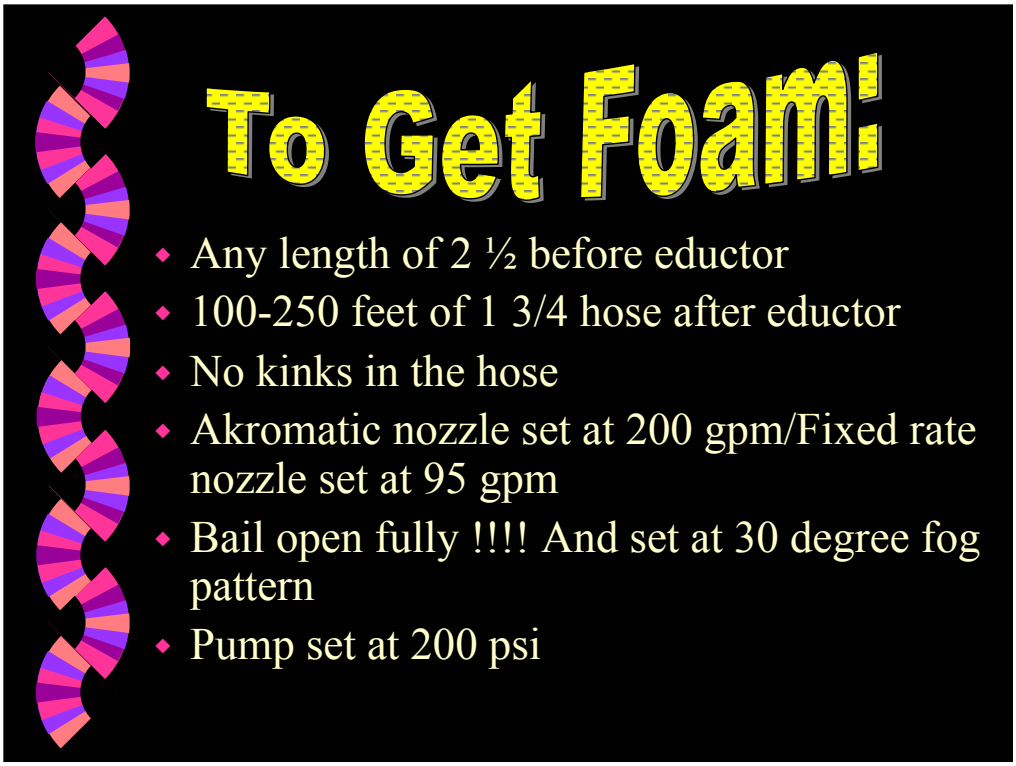

Application Techniques
For foam to be effective, it must be applied to the surface of the fuel in a manner that will allow it to set-up a blanket that will smother, cool and suppress vapors. If this blanket is disrupted by means of foam application or by personnel or equipment, the foam's effectiveness is diminished

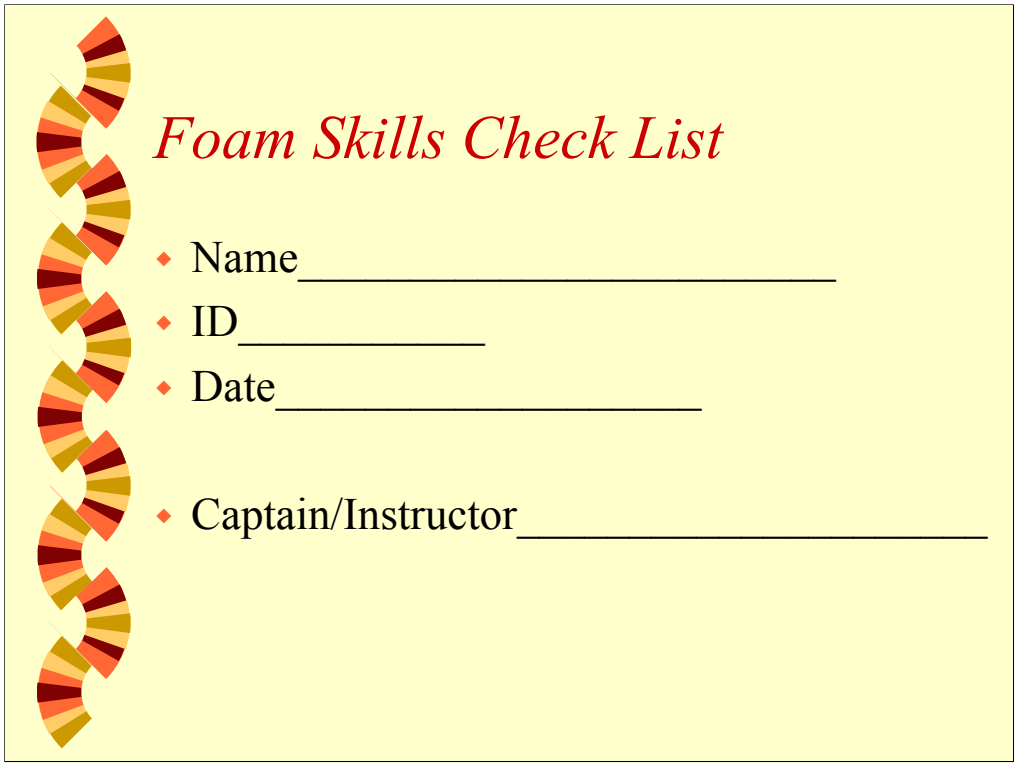
Application Techniques




Preserve the Foam Blanket


Cleaning the Eductor
Flush with clean water
this removes concentrate
allows check valve ball to move freely
check screen for clogs
review mp #911.47


To Get Foam!
Any length of 2 ½ before eductor
100-250 feet of 1 3/4 hose after eductor
No kinks in the hose
Akromatic nozzle set at 200 gpm/Fixed rate nozzle set at 95 gpm
Bail open fully !!!! And set at 30 degree fog pattern
Pump set at 200 psi



•The firefighter uses the proper technique for rolling a foam blanket onto a fire. Y_____N_____

•The firefighter uses the proper technique for applying foam using the rain-down method. Y_____N_____

•The firefighter uses the proper technique for applying foam using the banking method. Y_____N_____

•The firefighter will correctly set-up and use an in-line foam eductor. Y_____N_____

•The firefighter will demonstrate proper cleaning techniques of an in-line foam eductor. Y_____N_____